Perceptual and Motor Skills, 2003, 97, 1049-1050. © Perceptual and Motor Skills 2003

APPLICATION OF TRANSCEREBRAL, WEAK (1 MICROT) COMPLEX MAGNETIC FIELDS AND MYSTICAL EXPERIENCES: ARE THEY GENERATED BY FIELD-INDUCED DIMETHYLTRYPTAMINE RELEASE FROM THE PINEAL ORGAN?[1]

D. R. HILL AND M. A. PERSINGER

Laurentian University

Summary.—During the last 15 years weak, complex magnetic fields have been applied across the two cerebral hemispheres at the level of the temporoparietal lobes of more than 500 volunteers. Most of these subjects have reported visual, vestibular, and proprioceptive sensations as well as experiences of detachment from the body of 'sentient beings'. Similar but more intense experiences were reported by Strassman in 2001 for volunteers who were injected with N,n-dimethyltryptamine, a compound Strassman hypothesized as the primary mediator of these experiences. If this speculation is valid, then subjects who are exposed to the very weak, complex fields known to elicit similar experiences should display significant increases in the metabolites of this compound within their blood.

Applications of weak (1 microTesla) complex magnetic fields for between 5 min. and 30 min. across the two cerebral hemispheres at the level of the temporoparietal lobes have been reliably associated with experiences frequently labelled as "altered states" in more than 500 normal volunteers (Persinger, 1999, 2000). During the exposure the subject is blindfolded and sits in a comfortable chair housed within a darkened, closed acoustic chamber. The experiences are enhanced if the strength of the fields over the right hemisphere are about 10% greater than the fields over the left hemisphere and if the complex structure of the applied field contains a variety of intrinsic temporal patterns. They include burst-firing configurations containing a frequency-modulated or phase-modulated component.

Although there is great individual variability in the content of the experiences within a particular set of parameters, common general themes are spinning, seeing geometric shapes, bright colors, and blinding white lights, sensations of "movement forward through space," displacement of the self from the body, changes in the shape of a part of the body, and sensed presences. The attribution of the sensed presence ranges from a deceased member of a family to "another entity" with sentience. Also commonly reported is the sense of being "somewhere else," often described as mundane but clearly perceived as 'real'. The experients report observing other people engaging in "normal" behavior. Cartoon characters, specific animals, insects, and reptilian-like references occur less frequently. Odd tastes and smells with intense fear are more frequent than sexual arousal.

Strassman (2001) reported the experiences of most of his volunteers who received either .05 mg/kg or .4 mg/kg of N,n-dimethyltryptamine (DMT) were remarkably similar (although more intense) to those reported by subjects exposed transcerebrally to weak, complex magnetic fields. Dimethyltryptamine is the active ingredient of plants such as *ayahuasca* or *yage*. These entheogens have been employed by peoples in many cultures to access the experiences of sentient beings attributed to gods or dead ancestors.

[1]Please send correspondence to Dr. M. A. Persinger, Behavioral Neuroscience Laboratory, Laurentian University, Sudbury, Ontario, P3E 2C6 Canada.

Most individuals who were injected intravenously with this compound reported vivid visual experiences, out-of-body experiences, and "contact" with a variety of sentient beings with whom the experient felt connected and interactive. There was a range of experiences. However, individuals injected with saline did not report these experiences. One individual who received the drug experienced nothing at all.

Strassman argued that like N-acetyl-5-methoxy-tryptamine (melatonin), dimethyltryptamine is synthesized within the pineal organ of all humans. He suggested the release of this compound, due to hormonal disruptions associated with sudden changes in reinforcement schedules (life styles) or physiological extremes such as physical trauma, can produce 'natural' experiences similar to those evoked experimentally by injections of the drug. These experiences have been labelled historically and cross-culturally as variants of mystical experiences where individuals sense "other realities" and alien "sentient beings."

Strassman's implicit hypothesis is that all mystical experiences of this magnitude are related to the release of DMT into the blood. This results in subsequent stimulation of specific receptors within neurons located within regions of the brain that mediate all of these experiences. If this be valid, then experiences reported by our subjects who were exposed to complex, weak magnetic fields may have involved the release of this compound from the subjects' own pineal organs. Interestingly, nocturnal pineal melatonin levels correlated negatively with geomagnetic activity, and increases in geomagnetic activity are associated with more frequent experiences of "vestibular sensations" (Persinger & Richards, 1995) and nocturnal episodes of "bereavement" apparitions (Persinger, 1988).

One would expect, as with all natural processes, a normal distribution of individuals within the human population who have the capacity for synthesis and release of DMT within and from the pineal organ. If this hypothesis be valid, the blood levels of metabolites of DMT should increase significantly after exposures to the complex magnetic fields evoking the most potent experiences and be correlated with the intensity of those experiences.

REFERENCES

PERSINGER, M. A. (1988) Increased geomagnetic activity and the occurrence of bereavement hallucinations: evidence for melatonin-mediated microseizuring in the temporal lobe? *Neuroscience Letters*, 88, 271-274.

PERSINGER, M. A. (1999) Near-death experiences and ecstasy: an artifact of the organization of the human brain? In S. Della Salla (Ed.), *Mind myths*. New York: Wiley. Pp. 85-89.

PERSINGER, M. A. (2000) The UFO experience: a normal correlate of human brain function. In D. M. Jacobs (Ed.), *UFOs and abductions: challenging the borders of knowledge*. Lawrence, KS: Univer. of Kansas. Pp. 262-302.

PERSINGER, M. A., & RICHARDS, P. M. (1995) Vestibular experiences of humans during brief periods of partial sensory deprivation are enhanced when daily geomagnetic activity exceeds 15-20 nT. *Neuroscience Letters*, 194, 69-72.

STRASSMAN, R. (2001) *DMT: the spirit molecule*. Rochester, VT: Park St. Press.

Accepted October 20, 2003.